CLEAN AIR ACT SECTION 112(r) INSPECTION REPORT

Cerveceria India, Inc.

Mayaguez, Puerto Rico

GENERAL INFORMATION

Stationary Source	Cerveceria India, Inc.
Date of Inspection	December 4, 2007
USEPA Inspectors	Ellen Banner, USEPA – Region II (Edison, NJ) Geoffrey Garrison, USEPA – Region II, Caribbean Office, OSC Carlos Rivera, USEPA – Region II, Caribbean Office, Enforcement Doel Miranda – RST 2, USEPA – Region II
Contract Auditor	Neil Mulvey, Sullivan Group (Subcontractor)
Description of Activities	• Opening meeting with facility representatives. • Program audit. • Closing meeting with facility representatives. Program audit consisted of the following activities: 1. Document review. 2. Field verification. 3. Personnel interviews.

STATIONARY SOURCE INFORMATION

EPA Facility ID #	1000-0018-2312
Date of Latest Submissions	Re-Submission : August 17, 2007 – reviewed during the inspection although not received by the EPA Reporting Center. Most recent submission: 12/11/2007 – received by the EPA Reporting Center after the inspection. Anniversary Date: 12/11/2012
Facility Location	100 Blvd Alfonso Valdez Mayaguez, PR 00680 Mayaguez Municipio Tel. (787) 834-1000
Number of Employees	*RMP*Submit* states 280 employees. Union employees.

Description of Surrounding Area	Residential / Commercial. The facility is located in a populated area with residents and commercial businesses immediately adjacent to the facility.
Participants	Participants included representatives from: USEPA – Region II, Edison, NJ USEPA – Region II, Caribbean Office USEPA Contractor – RST2 USEPA Contractor – Sullivan Group Cerveceria India, Inc. The lead participant for Cerveceria India, Inc. was: Dwight Pagan – Environmental, Health & Safety Team Leader

REGISTRATION INFORMATION

Process ID #	4 (Ammonia Refrigeration System) 13 (Cold Block Ammonia Refrigeration)
Program Level (as reported in RMP)	Program 3 (both processes)
Process Chemicals	Ammonia Refrigeration System: Anhydrous Ammonia @ 19,100-lbs. Cold Block Ammonia Refrigeration: Anhydrous Ammonia @ 29,500-lbs.
NAICS Code	311213 (Malt Manufacturing) 31212 (Breweries)

BACKGROUND:

The USEPA has conducted two previous RMP compliance inspections of Cerveceria India, Inc.'s ammonia refrigeration system. The first inspection was conducted on October 8, 2003. The second inspection was conducted on August 17, 2005. The lead agency for the August 17, 2005 inspection was PR-EQB (JCA – Air). The results of these inspections are documented in separate reports.

At the time of the second inspection, facility management indicated that a new ammonia refrigeration system was planned for construction.

On October 6, 2007 the facility experienced a major accident resulting in a release of over 18,000-lbs. of anhydrous ammonia from the original refrigeration system (Program described above as the 'Ammonia Refrigeration System'). The incident was caused by a catastrophic failure of equipment in the carbon dioxide transfer system which caused an explosion impacting the ammonia refrigeration system in nearby areas. Severe damage to equipment and transfer lines in the ammonia refrigeration system resulted in the loss of over 18,000-lbs. of anhydrous ammonia. The anhydrous ammonia release resulted in the evacuation of residential population within a two square mile area and medical attention for one employee and 36 residents. The release continued for approximately 3.5 hours.

Facility management stated that this incident occurred within days of a planned permanent shutdown of the original ammonia refrigeration system and start-up of the new system (Program described above as Cold Block Ammonia Refrigeration). The primary equipment used in the original system (i.e., compressors, receivers, transfer lines) have been removed from site. The original ammonia refrigeration system no longer exists.

The purpose of the December 4, 2008 RMP inspection was not to conduct an investigation into the October 6, 2007 incident, but rather to inspect the new ammonia refrigeration system with respect to RMP compliance. It should be noted that the facility issued a complete accident investigation report of the October 6 incident, including recommendations to prevent similar incidents in the future. While the October 6 incident originated in the carbon dioxide transfer system (a non-RMP regulated process), there are many lessons learned as documented in the accident investigation report that have direct applicability to the management, operation, and maintenance of the new ammonia refrigeration system.

GENERAL COMMENTS

The facility operates on a 10.2 acre site located in a residential / commercial area. Private residences are located immediately adjacent to the western facility fenceline. The facility operates 24-7. A refrigeration system operator is on-site 24-7.

As stated above, the original ammonia refrigeration system no longer exists. The new system (registered as the Cold Block Ammonia Refrigeration) started-up in October/November 2007. The new system also uses anhydrous ammonia as a refrigerant and has a registered maximum inventory of 29,500-lbs.

The ammonia refrigeration equipment is located in two primary areas, the Machine Room and the Filtration Building. Major equipment located in the Machine Room includes:

- Four reciprocating compressors
- Two condensers
- One high pressure ammonia receiver (R-430)
- Ammonia vapor and liquid lines

Major equipment located in or near the Filtration Building includes:

- Liquid separator (S-330)
- Ammonia pumps
- Air handling units
- End use equipment including coolers, chillers, and plate heat exchangers
- Ammonia vapor and liquid lines

The ammonia refrigeration system is controlled through a programmable logic controller (PLC). The system design is state-of-the-art. In particular, some exemplary design features include:

- Six ammonia detectors located in the Machine Room with the following setpoints:
  35 PPM Alarm
  200 PPM Alarm 2
  700 PPM Shutdown
- Ammonia detection readings outside Machine Room.
- Six ammonia detectors located in the Filtration room with the following setpoints:
  25 PPM Alarm
  50 PPM Shutdown
- Machine Room ventilation fans with fan failure alarms.
- Emergency shutdown switches (one inside Machine Room and one outside Machine Room).
- Valves for all end use equipment (e.g., air handlers, coolers, chillers, plate heat exchangers) located on room outside of workspace thereby minimizing exposure to personnel in the event of a leak.
- Dual pressure safety valves (PSVs) on ammonia vessels/equipment.
- Physical protection on vulnerable equipment such as guards on glass sightglass level gauges.
- Water suppression system on the externally located liquid separator vessel (S-330).
- Sightglasses on the discharge lines from PSVs to help identify PSV releases.

RMP DOCUMENTATION

Cerveceria India's RMP program is contained in various manuals and file folders. Cerveceria's management team displayed an excellent understanding of the RMP requirements and the content and implementation of their written RMP programs and procedures. Written descriptions of the RMP programs were readily available as well as documents indicating active implementation of the programs.

Comments regarding select RMP elements follow:

Management System

The facility has a written description of the RMP Management System including description of RMP roles and responsibilities. The Management System description includes an organization chart depicting roles and responsibilities.

At the time of the inspection, the facility showed the inspectors the latest *RMP*Submit* registration which they thought had been submitted on August 17, 2007. However, according to the information in the EPA's database, the most recent submittal had been made on June 21, 2004.

With some assistance from Mr. Armando Santiago at EPA Headquarters', it was determined that the August 2007 submittal made by the facility was delivered to the Mayaguez Post Office, but never left that office. Due to these circumstances, the inspection team reviewed the copies of the August 2007 submittal which were provided by the facility. This submission included both the original ammonia refrigeration system and the new ammonia refrigeration system.

After the inspection, the facility re-submitted their registration, again including both the original ammonia refrigeration system and the new ammonia refrigeration system, referred to as the Cold Block Ammonia Refrigeration System. That submittal was received by the EPA Reporting Center on December 14, 2007.

Process Safety Information (PSI)

Reviewed the following piping and instrument diagrams (P&IDs):

- 1-102509 "NH3 Flow Diagram Engine Room & Separator Area", 09-07-04
- 1-102510 "NH3 Flow Diagram Production Area", 09-07-04
- 1-102511 "NH3 Flow Diagram Production Area", 07-13-04
- 1-102512 "NH3 Flow Diagram Production Area", 07-13-04

A spot comparison of the P&IDs against installed equipment was performed. In all cases the P&IDs were determined to be accurate. Labels and tags on equipment, lines, and instruments matched equipment designations as shown on the P&IDs.

Other available PSI included a list of design codes and standards to which the system was designed and installed, including ANSI/ASHRAE, ANSI/IIAR and IIAR standards. PSI also included MSDSs and equipment manuals.

Upon request, the facility provided three invoices verifying the quantity of ammonia charged into this new system. The invoices showed the following anhydrous ammonia charge dates and quantities:

7/26/07	6,660-lbs.
8/21/07	14,000-lbs.
8/29/07	6,000-lbs.

The total charged therefore is 26,660-lbs. and the registered inventory is 29,500-lbs.

Process Hazard Analysis (PHA)

A process hazard analysis (PHA), using the HAZOP technique, was completed for the new anhydrous ammonia refrigeration system over five session days in February 2007. The HAZOP was organized into 18 study nodes indicating a good level of detail. The HAZOP team was led by an outside consultant trained in the technique. Team members included facility personnel, construction company personnel, and a representative from the ammonia vendor. Reference documents included the process P&IDs, IIAR, and ANSI codes and standards.

Complete HAZOP documentation is contained in a PHA manual, including all study worksheets, team member identification, and reference to P&IDs. Worksheet documentation includes deviations, causes, consequences, identified engineering and administrative controls (i.e., safeguards), and recommendations. A total of 55 recommendations were identified. The facility has excellent documentation regarding the resolution of HAZOP recommendations including an "Action Item Record Sheet" for each recommendation, plus back-up documentation for each resolution. The HAZOP identified a total of 55 recommendations, however, recommendations tracking document lists only 50 recommendations. The facility explained that the missing recommendations were duplicates.

Standard Operating Procedures (SOPs)

Written standard operating procedures (SOPs) are contained in an Operational Procedures Manual dated 11/18/07. The facility has written SOPs for normal operation and other procedures including:

- Ammonia Truck and Cylinder Unloading; 11/18/07
- Emergency Response for Addressing Leaks; 7/8/07
- Planned and Emergency Shutdown Procedure; 7/18/07

The Emergency Shutdown Procedure does not provide detail on the status of specific equipment, valves, and instruments during an emergency shutdown (i.e., when an ammonia detector senses 700 PPM).

The facility is in the process of finalizing a written procedure for oil draining.

Training

Initial operator training was completed for operators assigned to the new ammonia refrigeration system. Training documentation includes a record of attendance at training for a specific topic and a 'certification statement' for each operator listing which SOP they were trained on. Training includes a review of the equipment operations manual and includes a detailed *Powerpoint*© presentation on the operating manual. Documentation and verification of training received is via detailed written tests. Incorrect test answers

are reviewed with each operator. Verification of this review includes initials of the employee and the date of the review. The facility intends to perform refresher training annually rather than once every three years, based on requests by the operators.

Mechanical Integrity

The following records exist for the new ammonia refrigeration system:

- Welding Procedure Specifications
- Welding Inspection Reports
- Material Receiving Reports
- Welding Test Reports
- Records of visual inspections
- Pressure Test Records
- Initial calibration records for detectors.

These records represent very good documentation of this new process.

The facility maintains a Mechanical Integrity Manual with specific preventive maintenance procedures for refrigeration equipment. Documentation includes a schedule of inspections and test for specific pieces of equipment, including the frequency inspections.

A review of records related to inspection/test of the 700 PPM emergency shutdown system was performed. The last test was performed on 12/2/07; documentation however was not specific to which compressor / solenoid valve(s) were tested

Management of Change (MOC) & Pre-Startup Review (PSR)

The facility has a written Management of Change (MOC) procedure, originally developed on 12/17/03. The MOC procedure properly addresses the RMP requirements for managing change. The MOC procedure is reviewed annually by the EHS Manager. The MOC procedure includes a form to document changes and management authorization of changes.

The facility has a Pre-Startup Safety Review (PSSR) guide, originally developed on 12/17/03. The PSSR guide properly addresses the RMP requirements for pre-startup reviews. The PSSR guide was last reviewed on 12/11/06. The PSSR guide includes a checklist to confirm completion of the pre-startup checklist.

The facility reported that there have been no changes to the new ammonia refrigeration system since start-up that would require an MOC review. The facility did have on file completed PSSRs for the new system.

Compliance Audits

The facility has a written Compliance Audit guide, originally dated 12/17/03. The Compliance Audit guide is reviewed annually by the EHS Manager, with the latest review completed on 12/11/06. The Compliance Audit guide includes procedures for conducting the required RMP audit as least once every three years. With the start-up of the new system in the Fall of 2007, a RMP compliance audit is not due until the Fall of 2010.

Incident Investigation

The facility has an Incident Investigation guide, originally developed on 12/17/03. The Incident Investigation guide was last reviewed on 12/11/06. The guide includes the necessary procedures for conducting RMP required incident investigations.

The facility conducted a comprehensive investigation into the October 6, 2007 ammonia release. The investigation was led by an outside consultant. A complete incident investigation report is on file. The report includes recommendations for improvements to the emergency response plan and program as well as process and management recommendations.

The October 6, 2007 accidental release of anhydrous ammonia meets the five-year accident history reporting criteria as described at 40 CFR 68.42. The facility is therefore required to submit the information required at 68.168, 68.170(j) and 68.175(l) within six months of the release or by the time the RMP was updated as required at 68.190, whichever was earlier. [68.195(a)]

Employee Participation

The facility has a written Employee Participation guide, originally developed on 11/20/03. The Employee Participation guide was last reviewed on 10/2/07. The guide includes the facility's policies for employee participation on the development and implementation of the RMP program and includes procedures for employee access to RMP documentation.

Hot Work Permit

The facility has a written Hot Work Permit procedure dated 1/14/05. The Hot Work Permit procedure addresses the necessary requirements. Hot work authorization is documented via a permit. Hot work permits dated 11/26/06, 11/25/06, and 11/22/06 were reviewed and found to be complete.

Contractor Safety

The facility has a written Contractor Safety guide, originally developed on 11/21/03. The Contractor Safety guide includes written procedures for contractor qualification, contractor employee orientation, and periodic inspections/audits of contractor work. Records of contractor orientation regarding general safety reviews, written tests to confirm contractor understanding of the orientation, and records of review of specific safety topics were reviewed and found to be acceptable.

Emergency Response

The facility has a written "Emergency Response Plan for Ammonia", dated January 2007. The Emergency Response Plan is comprehensive and includes procedures for ammonia leak detection, evacuation, notification, and the emergency response team,

FACILITY TOUR

Several items noted during the facility tour include:

- There was no ammonia odor anywhere in the plant. This is an indicator of good maintenance practices and a well operated system.
- All equipment, lines, valves, instruments are labeled and tagged. Labels and tags matched the equipment designations on the P&IDs.
- Housekeeping was excellent.

FINDINGS

Registration Information

- The most recent *RMP*Submit* re-submission lists two processes:

  ⇒ Ammonia Refrigeration System: Anhydrous Ammonia @ 19,100-lbs.
  ⇒ Cold Block Ammonia Refrigeration: Anhydrous Ammonia @ 29,500-lbs.

  The 'Ammonia Refrigeration System' is no longer in operation. The facility should re-submit its RMP*Submit to list only one ammonia refrigeration system.

- The October 6, 2007 accidental release of anhydrous ammonia meets the five-year accident history reporting criteria as described at 40 CFR 68.42. The facility is therefore required to submit the information required at 68.168, 68.170(j) and 68.175(l) within six months of the release or by the time the RMP was updated as required at 68.190, whichever was earlier. [68.195(a)]. The facility should therefore submit the required information before April 6, 2008.

Operating Procedures

- The Emergency Shutdown Procedure does not provide detail on the status of specific equipment, valves, and instruments during an emergency shutdown (i.e., when an ammonia detector senses 700 PPM). In order to ensure operator understanding of equipment status during an emergency shutdown, the Emergency Shutdown Procedure should provide detail on the status of equipment, valves, and instruments when an emergency shutdown is initiated, *as required by Part 68.69(a)(l)(iv).*

- The facility is in the process of finalizing a written procedure for oil draining. The facility should complete and issue the oil draining procedure for immediate use, *as required by Part 68.69(a)(3)(v).*

Mechanical Integrity

- A review of records related to inspection/test of the 700 PPM emergency shutdown system was performed. The last test was performed on 12/2/07; documentation however was not specific to which compressor / solenoid valve(s) were tested. The facility should modify mechanical integrity recordkeeping to include documentation identifying the specific piece of equipment tested/inspected, *as required by Part 68.73(d)(4).*

Accident Investigation

- The facility conducted a comprehensive investigation into the October 6, 2007 ammonia release. A complete incident investigation report is on file. The report includes recommendations for improvements to the emergency response plan and program as well as process and management recommendations. The facility should ensure that all of the recommendations identified in the investigation of the October 6, 2007 incident are resolved, with documentation of the resolution of each recommendation, *as required by Part 68.81(e).*

RECOMMENDATION

- The HAZOP identified a total of 55 recommendations, however, the recommendations tracking document lists only 50 recommendations. The facility explained that the missing recommendations were duplicates. The facility should review the HAZOP recommendations to confirm resolution of all 55 recommendations.